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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Devis Jellici

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EXAMINER

DUONG, DIEU HIEN

ART UNIT

PAPER NUMBER

2821

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DELIVERY MODE

02/17/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/582,641	<b>Applicant(s)</b> IELLICI ET AL.	
	<b>Examiner</b> DIEU HIEN T. DUONG	<b>Art Unit</b> 2821	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 11 December 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-14, 17-29 and 31-33 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14, 17-29 and 31-33 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. This office action is a response to applicant's supplemental amendment filed 12/11/2008. In virtue of these amendments, claims 15-16 and 30 are canceled; claims 31-33 are newly added; thus, claims 1-14, 17-29 and 31-33 are currently in the instant application.

### ***Specification***

2. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

***Drawings***

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the features set forth below must be shown or the feature(s) canceled from the claim(s). No new matter should be entered:

- a) “the electrically-conductive direct feed structure is directly attached to more than one side or surface of the dielectric pellet” (in claim 7);
- b) “the dielectric pellet is contained in an electrically-conductive cup or cage, and wherein the electrically-conductive direct feed structure is electrically connected to the cup or cage” (in claim 8);
- c) “a plurality of dielectric pellets” (in claim 20);
- d) “a gap defined between the dielectric pellet and the upper surface of the dielectric substrate is filled with a solid dielectric filler with a dielectric constant less than the dielectric constant of the dielectric pellet” (in claim 28);
- e) “a dielectric spacer material is provided between the surface of the dielectric pellet and the radiating antenna component” (in claim 32);

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as “amended.” If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 19, the recitation "further comprising at least one additional radiating antenna component having a surface that faces a surface of the dielectric pellet", in lines 1-3 is unclear. It is not clear that "a surface of the dielectric pellet" in line 3 of claim 19 is the same or different with "a surface of the dielectric pellet" in line 9 of claim 1. If they are the same, it should be changed to "the surface of the dielectric pellet". If they are different, it should be changed to "a second surface of the dielectric pellet".

Clarification is required.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-6, 9-12, 19, 21-23 and 25-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Kuramoto et al. (US 2003/0132885 A1).

Regarding claim 1, Kuramoto discloses, in Figures 3, 5, 16 and 18, an antenna structure comprising a dielectric pellet (2, Figure 18A), and

a dielectric substrate (10a, Figure 5) with upper and lower surfaces and a groundplane (11, Figure 5), wherein the dielectric pellet (2) is elevated above the upper surface of the dielectric substrate (10a) such that the dielectric pellet (2) does not directly contact the dielectric substrate (10a) or the groundplane (11), the dielectric pellet (2) comprising an electrically-conductive direct feed structure (3), and wherein the antenna structure additionally comprises a radiating antenna component (80) which is elevated above the upper surface of the dielectric substrate (10a) and has a surface that faces a surface of the dielectric pellet (2).

Regarding claims 2-5, as applied to claim 1, Kuramoto discloses, in Figure 5, wherein the electrically-conductive direct feed structure (3) extends from the upper surface of the dielectric substrate (10a) and directly contacts the dielectric pellet (2); wherein the electrically-conductive direct feed structure (3) physically supports the dielectric pellet (2); wherein the dielectric pellet (2) is elevated above the groundplane

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(11) or the dielectric substrate by a low permittivity antenna support structure; wherein the electrically-conductive direct feed structure (13) is selected from a group consisting of a conducting leg (3), a spring-loaded pin, a metal strip or a metal ribbon.

Regarding claim 6, as applied to claim 1, Kuramoto discloses, in Figures 3, 5 and 18, wherein the electrically-conductive direct feed structure (3) is directly attached to at least one side or surface of the dielectric pellet.

Regarding claim 9, as applied to claim 1, Kuramoto discloses, in Figure 16, wherein at least one side or surface of the dielectric pellet (2) is metallised (6), and wherein the electrically- conductive direct feed structure (3) is soldered or otherwise electrically connected to the metallised side or surface.

Regarding claim 10, as applied to claim 1, Kuramoto discloses, in Figures 3, 5 and 18, wherein the electrically-conductive direct feed structure (3) is a spring-loaded pin extending upwardly from the upper surface of the dielectric substrate (10a), wherein the dielectric pellet (2) has a metallised underside (6) that faces the upper surface of the dielectric substrate (10a), and wherein a tip of the spring loaded pin (3) electrically contacts the metallised underside (6).

Regarding claim 11, Kuramoto discloses, in Figure 18A, wherein the radiating antenna component (80) is an electrically-conductive antenna component.

Regarding claim 12, as applied to claim 11, Kuramoto discloses, in Figure 18A, wherein the radiating antenna component (80) is selected from a group consisting of patch antenna (80), slot antenna, monopole antenna, dipole antenna, planar inverted-L antenna and planar inverted-F antenna.

Regarding claim 19, as applied to claim 1, Kuramoto discloses, in Figure 19, wherein further comprising at least one additional radiating antenna component (90) having a surface that faces a surface of the dielectric pellet (2).

Regarding claim 21, as applied to claim 1, Kuramoto discloses, in Figure 5, wherein the ground plane (11) is located on the lower surface of the dielectric substrate (10a).

Regarding claim 22, as applied to claim 1, Kuramoto discloses, in Figure 10, wherein the ground plane (31) is located on the upper surface of the dielectric substrate (30a).

Regarding claim 23, as applied to claim 1, Kuramoto discloses, in Figure 8, wherein a first groundplane (21) is located on the upper surface of the dielectric substrate (20a) and a second groundplane (23) is located on the lower surface of the dielectric substrate.

Regarding claims 25-26, as applied to claim 1, Kuramoto discloses, in Figure 8, wherein the groundplane (21) extends across at least that part of the dielectric substrate (20a) that is located directly below the elevated dielectric pellet (2); wherein the least one groundplane extends across substantially an entire area of the dielectric substrate.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



9. Claims 7- 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Mizuno et al. (US 5,010,349).

Regarding claim 7, Kuramoto discloses every feature of claimed invention as expressly recited in claim 6, except for the electrically-conductive direct feed structure being directly attached to more than one side or surface of the dielectric pellet.

Mizuno discloses, in Figure 9, the electrically-conductive direct feed structure being (24) directly attached to more than one side or surface of the dielectric pellet (22).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the attachment of the feed structure to the dielectric pellet of Mizuno in the antenna structure of Kuramoto to achieve the claimed invention, doing so would increase frequency band width of the antenna (col. 1, lines 22-24).

Regarding claim 8, Kuramoto/Mizuno disclose, (Mizuno, Figure 22 and col. 3, lines 14-39), the dielectric pellet (22) is contained in an electrically-conductive cup or cage, and wherein the electrically-conductive direct feed structure (24) is electrically connected to the cup or cage (22).

10. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Horie et al. (US 2005/0259007 A1).

Regarding claims 13-14, Kuramoto discloses every feature of claimed invention as expressly recited in claim 1, except for wherein the radiating antenna component is a dielectrically loaded antenna component; wherein the radiating antenna component is configured as a planar inverted-L antenna with a radiating structure extending over a block of dielectric material such as a dielectric ceramic material.

Horie discloses, in Figure 1, the radiating antenna component is a dielectrically loaded antenna component; wherein the radiating antenna component (2) is configured as a planar inverted-L antenna with a radiating structure extending over a block of dielectric material such as a dielectric ceramic material (1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the radiating component of Kuramoto with the radiating component as taught by Horie to achieve the claimed invention in order to achieve a compact antenna that has a wider bandwidth (Kuramoto par. [0010]).

11. Claims 17- 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Kawahata et al. (US 6,147,650).

Regarding claims 17-18, Kuramoto discloses every feature of claimed invention as expressly recited in claim 1, except for the radiating antenna component (80) is provided with an independent feed; wherein the radiating antenna component is a planar inverted-F antenna.

Kawahata discloses, in Figure 1, the radiating antenna component is provided with an independent feed (3c); wherein the radiating antenna component is a planar inverted-F antenna.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the radiating antenna component of Kuramoto with the radiating antenna component as taught by Kawahata in order to achieve a compact antenna that has a wider bandwidth (Kuramoto par. [0010]).

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12. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Scordilis (US 6,384,793).

Regarding claim 24, Kuramoto discloses every feature of claimed invention as expressly recited in claim 1, except for the ground plane being sandwiched between the upper and lower surfaces of the dielectric substrate.

Scordilis discloses, in Figures 3a-3b, the ground plane being sandwiched between the upper and lower surfaces of the dielectric substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the arrangement of the ground plane of Kuramoto with the arrangement of the ground plane as taught by Scordilis to achieve the claimed invention in order to achieve a compact antenna that has a wider bandwidth (Kuramoto, par. [0010]).

13. Claims 20 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1).

Regarding claims 20 and 27, Kuramoto discloses every feature of claimed invention as expressly recited in claim 1, except for a plurality of dielectric pellets; and the ground plane being absent from an area of the dielectric substrate that is located below the dielectric pellet. However, such difference is not of patentable merits since it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine area of the ground plane on the dielectric substrate and the number of dielectric pellets for the antenna structure to achieve the desired antenna

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radiation characteristics and such modification would have been deemed obvious to person skill in the art of antenna.

14. Claims 28-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Tan et al. (US 6,680,705 B2).

Regarding claims 28-29, Kuramoto discloses, in Figure 5, wherein a gap defined between the dielectric pellet (2) and the upper surface of the dielectric substrate (10a).

Kuramoto does not disclose a solid dielectric filler being filled in the gap and having a dielectric constant not more than 10% of the dielectric constant of the dielectric pellet.

Tan discloses, in col. 3, lines 27-34, the gap being filled with a solid dielectric filler with a dielectric constant.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the dielectric filler of Tan in the gap of Kuramoto to achieve the claimed invention in order to improve the bandwidth performance of the antenna (see Tan, col. 1, lines 34-40).

Note that: it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine the dielectric constant of the solid dielectric filler and dielectric pellet to optimum the radiation characteristics of the antenna. Therefore, to employ having the solid dielectric filler having a dielectric constant not more than 10% of that of the dielectric pellet would have been obvious to person skill in the art.

Regarding claims 31-32, Kuramoto/Tan disclose, (Tan, in Figure 2, col. 3, lines 27-34), an air gap being provided between the surface of the dielectric pellet (203) and the radiating antenna component (201); or wherein a dielectric spacer material is provided between the surface of the dielectric pellet (203) and the radiating antenna component (201).

15. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kuramoto et al. (US 2003/0132885 A1) in view of Kawahata et al. (US 5,959,582).

Regarding claim 33, Kuramoto discloses, in Figures 5, 16, 18, an antenna structure comprising

a dielectric pellet (2) and a dielectric substrate (10a) with upper and lower surfaces and at least one groundplane (11), wherein the dielectric pellet (2) is elevated above the upper surface of the dielectric substrate (10a) such that the dielectric pellet (2) does not directly contact the dielectric substrate or the at least one groundplane (11), the dielectric pellet being provided with an electrically-conductive direct feed structure (3) that is in direct electrical contact with the dielectric pellet (2), and wherein the antenna structure additionally comprises a radiating antenna component (80, Figure 18A) having a conductive element as a primary radiator, the radiating antenna component (80) being elevated above the upper surface of the dielectric substrate (10a) and having a surface that faces a surface of the dielectric pellet.

Kuramoto do not disclose that the dielectric pellet being a dielectric ceramic pellet.

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Kawahata discloses, col. 3, lines 15-17, the dielectric pellet being a dielectric ceramic pellet.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the ceramic dielectric of Kawahata in the dielectric pellet of Kuramoto to achieve the claimed invention in order to achieve a compact antenna that has wide bandwidth (Kuramoto, par. [0010]).

### ***Response to Arguments***

16. Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection. This action is made None-Final.

### ***Inquiry***

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIEU HIEN T. DUONG whose telephone number is (571)272-8980. The examiner can normally be reached on Monday - Friday, from 8:30AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Douglas W. Owens can be reached on 571-272-1662. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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*/Trinh Vo Dinh/*

*Primary Examiner, Art Unit 2821*